**BIOFEST TOPICS - REVISED**

**9th grade topics**

* + **Genetically Modified Organisms:** is an organism whose genetic material has been altered (GMO’s including cloning)
  + Genetic Modification Research / Techniques
  + Genetically Modified Animals
  + Genetically Modified Crops
  + Genetically Modified Bacteria
  + Whole-Organism Cloning
* **Genetic Screening for Diseases and Disorders:** analyzing people to determine genetic susceptibility to a particular disease
  + Pre-implantation Genetic Diagnosis (screening embryos before in-vitro fertilization)
  + during Pregnancy
  + in Adulthood
  + gene-based conditions (you can choose a genetic disorder to study or do a general overview of the types of genetic disorders – two partners could do this subtopic if they choose different genetic diseases to study)
* **Vaccination/ Immunization:** any substance used to stimulate the production of antibodies and provide immunity against one or several diseases
  + Pandemics (you can choose a particular pandemic such as swine flu or SARS)
  + Mandatory Vaccinations
  + Development of vaccination techniques (ex: Salk vs. Sabin vaccine)
  + Links between MMR vaccine and autism
* **Industrial or Environmental Biotechnology:** the development and use of biological systems for remediation of contaminated environments, and for [environment](http://en.wikipedia.org/wiki/Natural_environment)-friendly processes
  + Bioremediation using bacteria
  + Bioremediation using plants (phytoremediation)
  + Bioremediation to control natural disasters (ex: oil spills)
  + Pest Control for Crops using Genetic Modification
* **Antibiotic Resistance:** is when a microorganism develops the ability to survive exposure to an antibiotic
  + Over-prescription of Antibiotics
  + How to control/combat antibiotic resistant microbes
  + Case study of an epidemic: MRSA
  + History of penicillin use and growing bacterial resistance to penicillin
* **DNA Profiling:** (also called DNA testing or genetic fingerprinting) is a technique used to identify individuals based on their unique DNA profiles
  + Crime scene identification
  + Paternity cases
  + Science behind DNA fingerprinting (gel electrophoresis)
  + Creation of DNA Databases